

When Robots Dream

Christopher Penzenik

Submitted to the faculty of the Herron School of Art and Design
in partial fulfillment of the requirements for the degree
Master of Fine Arts in Visual Art
in the Herron School of Art and Design
Indiana University

May 2017

The distance between science fiction and science fact, in terms of invention and technology, has never been narrower than it is in the present day. Many of the technological advances in the last forty years have originated in science fiction. While this was never a goal of science fiction, it is an interesting side effect that has become common to the genre. Science fiction allows an outlet to create artifacts that do not (and in some cases, cannot) exist with the current level of technology, but it is a medium that pushes individuals to create beyond their current means. In a 2004 *TED* talk at Erasmus University, Rotterdam, Professor Etienne Augé spoke on the role of science fiction and how humanity has integrated the theories behind it.

Science fiction is not about predicting the future. The future doesn't exist. Science fiction is here to prevent and invent the future. Preventing the future in the sense that science fiction can tell us the danger that future holds for us, but it can also help us invent the future and make sure the future is without those dangers.¹

I have always loved science fiction for this sense of invention: the many themes explored in this genre allow the viewer to dream of a better tomorrow. Of all these themes, it is the creation and use of robots that I am most drawn to. As a furniture designer, I endeavor to combine this art form with the concept of science fiction based robots. The result is a set of robots that are forever asleep; robots whose sole remaining function is to act as tables.

By translating my research into a functional art form that is both known and comfortable, my furniture explores the concepts of invention as seen through science fiction. My research focuses on the importance of robots in science fiction: their design, their purpose, and the role they play in the lives of their human masters. However, unlike the

¹ Etienne Augé. "Why Our World Needs Science Fiction: Etienne Augé at TEDxErasmus University", *YouTube*, 23 Mar. 2014.

robots of science fiction, or even the very real robots of the present day, the robots I create are made using both new maker technologies as well as the traditional woodworking techniques of a furniture maker. These robots show their functionality in that their forms double as tables, taking their materials and dimensions from the field of furniture design. With the knowledge that all of these elements make my robots somewhat fall into a niche, the need for an ideal viewer becomes more important than normal, a viewer with a true appreciation for science fiction.

To say that science fiction influences me would be an understatement. Science fiction has been my entertainment genre of choice for as long as I can remember. Growing up with movies such as *Star Wars*, *Tron*, and *Short Circuit*, I was inundated with fantasy worlds that explored the possibilities of human invention, especially in regards to the creation and use of robots. Looking back, I can identify a key factor that gave me a lifelong fascination with robots. In 1985, Lucasfilm released a Saturday morning cartoon titled *Star Wars: Droids*. This series followed the misadventures of R2-D2 and C-3PO, giving fans a glimpse into what this universe looked like shortly before the original *Star Wars* film. What was most intriguing about this show, however, was the depiction of not only the heroes, but of the many different types of droids depicted in the *Star Wars* movies. There were important droids, comical droids, malevolent droids, and droids that served no other purpose than to “chew scenery”. Having only been a small child when this came out, I was enthralled by the different robots and the characters they embodied. This assortment of robots with specific personalities and purposes has had a direct influence on my *RBT-X* series of robot tables; the name of which acts as an acronym for the term “robotics”. Each table serves a

specific purpose that is shown through its dimensions and illustrated robot parts.² This depiction of robots in the cartoon flavored how I have thought robots should be portrayed in science fiction; they need not be simple machines, but rather, they can be as human as any living, breathing person.

As I have matured, my enjoyment of science fiction has drifted from the escapism found in future landscapes and over-the-top adventure and has settled into a fascination with the technology used within the genre, specifically those technologies that are a small stretch from that which we currently possess. As Augé stated, science fiction is about inventing the future. This can be seen most clearly in the technologies developed in *Star Trek*. From phasers and tricorders to the ship's computer, Gene Roddenberry came up with concepts that seemed at the time fantastical, but in some cases, are now considered mundane. In recent years, the technology behind lasers as both weaponry and manufacturing tools has grown exponentially. There are militarized lasers that have been prototyped as defense weapons. The laser cutter/engraver that I have been using to create the illustrated bodies of my *RBT-X* series is a perfect example of using the fictional technology in a size comparable to *Star Trek* and giving it a purpose that might be more beneficial than detrimental. The tricorder and the ship's computer can be seen in the technological growth of personal computers, smartphones, and the internet. In a similar way, my robots incorporate state of the art furniture technologies such as 3-D design software and laser cutters to aid users in their everyday lives; the design of the tables not only mimics the form of a robot, but its trapezoidal shape allows the user to step right up to it, creating an intimate interaction. Likewise, the laser cutter allows for these tables to not only have robotic designs illustrated on their surfaces, but

² Image 01

also allows these designs to serve a purpose; the circular etchings on the top of the *RBT-X: Mark V* act as a housing for specially designed coasters. Both the etchings and the coasters aid the user experience by creating a secure location to set glasses that might otherwise damage the table.

To say that innovations in technology have come about primarily as a result of science fiction would not be completely accurate. While science fiction has certainly given inspiration to makers, especially in the last thirty years, it is important to look at what inspired much of science fiction in the first place: namely, the space race. Beginning in 1955, the Soviet Union and the United States set their sights on becoming the first nation to conquer space flight, causing scientists to invent never before seen technologies in an effort to not only escape Earth's atmosphere, but to safely explore space and return home. In 1962, President John F. Kennedy gave his iconic "We choose to go to the Moon" speech, which inspired a feeling of patriotism and a desire to reach the stars among the U.S. citizenry. Seven short years later, Neil Armstrong and Buzz Aldrin became the first two humans to step foot on the lunar surface. This desire for space exploration ushered in a plethora of new technologies, from rocket engines and lunar modules to smoke detectors and satellite television. Many technologies that are simply taken for granted in the present day would still be fictional if not for the needs of the space race. In turn, this exploration brought about a sense of wonder in humanity and science fiction saw a rise in popularity. Authors would exaggerate the oddities of space exploration, adding fantasy into what was a real adventure still in its infancy. Science fiction novels, movies and television shows would incorporate their own new technologies to aid characters in their exploration such as with the examples from *Star Trek*.

As a new generation of scientists, inventors, and makers came into their own, they were inspired both by the very real technologies created for space travel as well as those created for science fiction. Communication devices such as the cell phone are taken directly from shows like *Star Trek*; this technology has allowed for faster communication between those on Earth and those in space. Even the International Space Station was inspired by science fiction: NASA has firmly espoused that the movie *2001: A Space Odyssey* was directly responsible for many of the innovations behind both the space station and multiple pieces of technology aboard it.

In the case of robots, companies are pouring time, money and ingenuity into the creation and advancement of robots and artificial intelligence on a daily basis. The robotics company, Boston Dynamics, has been known for their quadrupedal robots that move in ways extremely similar to the animals they are named after. These robots have in part been created with an eye for being an addition to public safety, though the company's end goal is to create an autonomous robot, with little to no specificity on the design that might take. Toy manufacturer Anki has created a small, programmable robot named Cozmo whose look and function is straight from the animated movie *Wall-E*. The design of each of these robots is fairly basic, at least in comparison to many of the humanoid robots seen in science fiction. These robots are created to do a few, very specific tasks and their designs illustrate these basic functions. I have taken this idea and implemented it directly into my own robotic tables.

In terms of the design of my robots, I have looked to the forefathers of illustration and prop making for inspiration. Ralph McQuarrie, the concept artist behind R2-D2, C-3PO and many of the droids in the original *Star Wars* struck me with his utilitarian designs. His

robots are created to serve very specific purposes. R2-D2, with his squat body, gliding feet, and multiple tool compartments was made for use on spacefaring vessels, having the ability to make repairs and act as a co-pilot in X-Wing fighters. C-3PO has a much more humanoid appearance as he acts more as a personal assistant to humans who might want a droid they are comfortable having a conversation with. James Cameron, director of *Terminator* designed the original robot for that movie, with its creation being handled by famed creature creator Stan Winston. They aimed to create a humanoid robot with a skeletal look in order to clearly show the inhumanity of these beings. Each of the robots in these movies is not a simple programmed machine, but has a very human personality and the viewer cannot help but feel for the characters. It does not matter if they are humanoid or more machinelike, each robot is as much a character as the living, breathing humans in the movie. This personification is one of the end goals I have in my visual research.

The primary influence of my *RBT-X* series of robots can be seen most clearly in the design of the robot Claptrap from the *Borderlands* series of video games. Constructed with a box-like body, its appendages are either hidden or downplayed. This allows the robot to contain allusions to a humanoid design, while at the same time moving towards being purely utilitarian. My robots fall into this latter category. Their bodies may share the trapezoidal look of Claptrap, but their illustrated purposes do not have need of human-like appendages. Each robot is made entirely of wood, rather than the high-tech materials required for a functional android. This is done as a way to still allude to their robotic heritage but to also help clarify their true role as furniture pieces. Much like with artist Tom Sachs' *Space Program*, these robots are a three-dimensional illustration of robotics, from the design and manufacturing processes, to the illusion of each robot's purpose. The materials they are

made from and their primary functionality does not need to match that of real robots, much in the way that Sachs' space crafts do not need to actually make the trip to another planet.

The tables in the *RBT-X* series, as with fully functional robots, are meant to be used. They are, first and foremost, tables, albeit with the forms of robots. As tables, they are meant to have objects placed on them. As robots, their functionality would be determined by their size and form, though in this case, that functionality is only alluded to. In order to properly demonstrate the use of these tables to the viewer, an operator's manual is provided, showing the "proper use" of a table.³ Viewers are encouraged to take a manual with them as they view the tables so they will know just what the intended purpose is. This document helps to illustrate the sense of irony and absurdity in these pieces. While each piece is painstakingly crafted to resemble a wooden robot, the only use that can be obtained from them is that of a simple table. Even the etched illustrations on each table are created in such a way as to make the table fully functional for its more mundane purpose. This irony is shown even further in the detailed process I used to make each table.

The creation process of my robotic tables can be seen in the manufacturing background that I grew up in. For the past sixty years, my family has owned a steel and plastics fabrication business, creating utilitarian parts for the semi-trailer industry. The methods of manufacturing that I grew up around are evident in my own processes. My robots come about first as a rough sketch and then as a computer designed blank. This digital form allows me to work out all of the sizes, dimensions, angles, and connections necessary to construct each robot. It also allows me to size each robot against the others. This is important because as members of a series, each robot needs to be related in specific ways to

³ Image 02

its predecessors. Once I am happy with the overall designs, I then move to digital illustration programs to create the surfaces of each robot. The goal is not to create a robot with all of the functional pieces that a real robot might have, but to make clear allusions to those parts. Using my background as a graphic designer and illustrator, I create digital drawings of the robots in Adobe Illustrator. These designs are then fed into a laser cutter and engraved into wood. I am able to control the depth of the engraving, adding a bit of line weight where a simple two-dimensional drawing might be lacking. Following the design phase, I move on to manufacturing. Each piece is cut out in correspondence with similar pieces from each robot. Therefore, all sides that need a 45° angle will be cut one after the other. The same is done for all other pieces with corresponding angles. Once cut out, each robot body gets joined using miter cut edges, a method used frequently in furniture design. Each robot has tapered legs of the same design, the only differences being the overall sizes. This phase of the creation process is very similar to an assembly line that would be used in traditional manufacturing. By minimizing the alterations in the angle of the table saw blade, I can speed up the cutting process, which allows multiple tables to be crafted at once.

Deeply carved into the philosophy of these robots is the use of phenomenology; this can be seen in both the choice of materials and the tactile qualities of the illustrations. The concept of a wooden robot is also a very foreign thought; the contrast between the design and the materials causes a reaction with the viewer wherein they want to examine the details of each piece. The warmth of the wood itself has an inviting quality one would expect or want from objects you live with that a metal or plastic robot might not be able to achieve. This warmth creates the same sense of humanity that can be seen in such robots as C-3PO and R2-D2. When confronted with the illustrations on each piece, the viewer can look at every side

for new details. The engravings are set to different depths depending on what they are illustrating. While these depths do not take away from the functional purpose of each piece, they do allow the viewer to experience the tactile qualities of each surface.

Another aspect of phenomenology that can be added to this series lies in the setting. When speaking in terms of phenomenology, every aspect of how a piece is viewed needs to be taken into account. Therefore, the location, the lighting, and the spacing are incredibly important. In *Phenomenology of Perception*, Maurice Merleau-Ponty discusses the use of space and its importance in truly understanding a work of art.

Space is not the setting (real or logical) in which things are arranged, but the means whereby the positing of things becomes possible. This means that instead of imagining it as a sort of ether in which all things float, or conceiving it abstractly as a characteristic that they have in common, we must think of it as the universal power enabling them to be connected.⁴

In terms of the *RBT-X* series, the space that the robots reside in is not merely a setting, but it is a crucial element to the success of the series. These tables scream to be viewed in a sleek, modern environment. For my culminating thesis project, each robot is lit by two to three spotlights, highlighting them as though they were a sleek piece of technology. This forces the viewers' eye to focus solely on the robots and would add an air of crispness and newness to them. This heightens the idea that these are state-of-the-art pieces, as this is often how items such as high-end automobiles are unveiled to the public. When the only thing the viewer can properly see is the robot, it subconsciously becomes something the viewer will desire. I chose this type of a setting because it not only speaks to the potential an actual robot might have as a piece of consumer technology, but it also speaks to the public's "need" to own the newest, shiniest toys. By displaying each robot as a desirable object, it calls into question the concept

⁴ Maurice Merleau-Ponty, *Phenomenology of Perception*. London: Routledge & K. Paul, 1962.

of how the robot is to be used.

Every robot is created to serve a purpose. In the case of the robots of the *RBT-X* series, they serve both an actual purpose and a fictional purpose. Each robot is created with specific dimensions and with specific materials in order to serve its purpose as a table. The naming for each robotic table is indicative of its place within the series. As with the prototyping practices of many new technologies, with a primary examination at how series are named, my robots follow the convention of starting with a series name (RBT-X) and following this with the standard way of designating a version: *MARK*. The *Mark II* has the dimensions of a standard end table⁵; the *Mark III* stands at thirty inches tall⁶; the standard height of a dining table or desk; the *Mark IV* is a long and narrow table reminiscent of a hall table⁷; the *Mark V* is the shortest but overall largest with the style of a coffee table⁸; and the *Mark X* is the largest at thirty-six inches tall, the height of a bar or standing table.⁹ Each robot also has a fictional purpose. This is the purpose engraved into the design of the robot as well as by its prescribed dimensions. The *Mark II*, being the smallest robot and the earliest of the series, is a general helper. It can do a few tasks, but do them well, much in the same vein as R2-D2. The face of the robot contains a single optical sensor and a basic audio sensor. The top of the *Mark II* contains two simple illustrated hatches, which could be used for containing basic tools.¹⁰ The *Mark III* stands taller and has compartments at easy reach for the user, making it a suitable personal assistant. This robot also contains multiple optical

⁵ Image 02

⁶ Image 03

⁷ Image 04

⁸ Image 05

⁹ Image 06

¹⁰ Image 07

and audio sensors and its rear face contains a power meter and power button.¹¹ The *Mark IV* stands at the same height as the *Mark III*, but is much longer, giving the sense of a creature that moves with long, graceful strides.¹² The *Mark V*, with its short legs and wide body, marks a different direction in the *RBT-X* series. Containing multiple optical sensors that are spread out along its face, it is ideal for wading into the underground. It also contains removable plates on its top in the form of coasters.¹³ The *Mark X* is a large, lumbering robot suited for manual labor and the moving of heavy objects with a complex array of sensors and a clearly readable power meter.¹⁴ As an additional accessory, the *Mark X* comes equipped with a quarter inch thick acrylic top to protect its surface. I refer to these roles as fictional because the components for these tasks are alluded to through the engraved illustrations. Were these fully functioning robots, these would be the tasks they would naturally be programmed to complete.

Giving these robots an illustrated function that perhaps overshadows the actual function of the table lends a sense of irony to the *RBT-X* series. It is almost a tease to have laser etched robot parts that look so close to being able to accomplish their purpose, but are only three-dimensional illustrations. This sense of irony adds a feeling of humor, or at the very least satire, to the robots. This humor can also then be transcribed into the “personalities” of each robot.

Not only do these robots serve an illustrated purpose, but they each have an illustrated personality. This is shown through the size, shape, and illustrated features of the tables. Much of this idea comes from science fiction where robots that look a certain way have a

¹¹ Image 08

¹² Image 09

¹³ Image 10

¹⁴ Image 11

certain personality to match, R2-D2 is the short, sometimes feisty helper while C-3PO is very human-like and has the personality of a refined, if somewhat whiny butler. I have never seen robots as something that we might one day have to fear. The portrayal of robots as killing machines in science fiction has always seemed a bit melodramatic to me. I relate more to Isaac Asimov's views on robots. In many of his novels and short stories, he speaks of the First Law of Robotics: "No robot may harm a human being, or through inaction, allow a human being to come to harm."¹⁵ It stands to reason that even with a much more advanced artificial intelligence, a robot is still being programmed initially by a human, and that human would install something akin to this First Law of Robotics. This would allow humans to be safe around robots and there would not be the worry or apocalyptic destruction at their hands. In his short story, *Little Lost Robot*, Asimov tells the story of a robot who went into hiding after being told to lose itself by a human. This robot is described as cleverer, more curious, and more annoying than simple robots.¹⁶ This is a robot that has caused all sorts of havoc at a military installation simply by hiding. It is this type of personality that I am drawn to in my own robots by bringing them inside the home to serve a common need. Taking into consideration these personalities, purposes, and aesthetic, I also thought about their literal place in the world, as robots masquerading as a coffee table, nightstand, and other table forms.

The *RBT-X* series is the culmination of the work I have done at Herron: it is a body of work that clearly illustrates my developing style of furniture design as well as those goals I have developed in my visual research. Science fiction is a topic I am passionate about and giving voice to this passion through a furniture form adds a never before seen symmetry to

¹⁵ Asimov, Isaac, *I, Robot*. New York: Bantam Books, 1991.

¹⁶ Asimov, Isaac, *I, Robot*

my journey as an artist. Exploring the concept of robotics allows me to take a look into the future with a sense of invention in the way that a science fiction author might, while at the same time keeping myself grounded in the classic techniques of woodworking and supplying my audience with a product that can meet a common need.

Bibliography

Asimov, Isaac, *I, Robot*. New York: Bantam Books, 1991.

Augé, Etienne. “Why Our World Needs Science Fiction: Etienne Augé at TEDxErasmus University”, *YouTube*, 23 Mar. 2014.

Falker, Dr. Jay, “NASA 360 Presents – From Science Fiction to Science Fact”, *YouTube*, 28 Oct. 2014.

Merleau-Ponty, Maurice, *Phenomenology of Perception*. London: Routledge & K. Paul, 1962.



Image 01
When Robots Dream
 Baltic Birch and Cherry

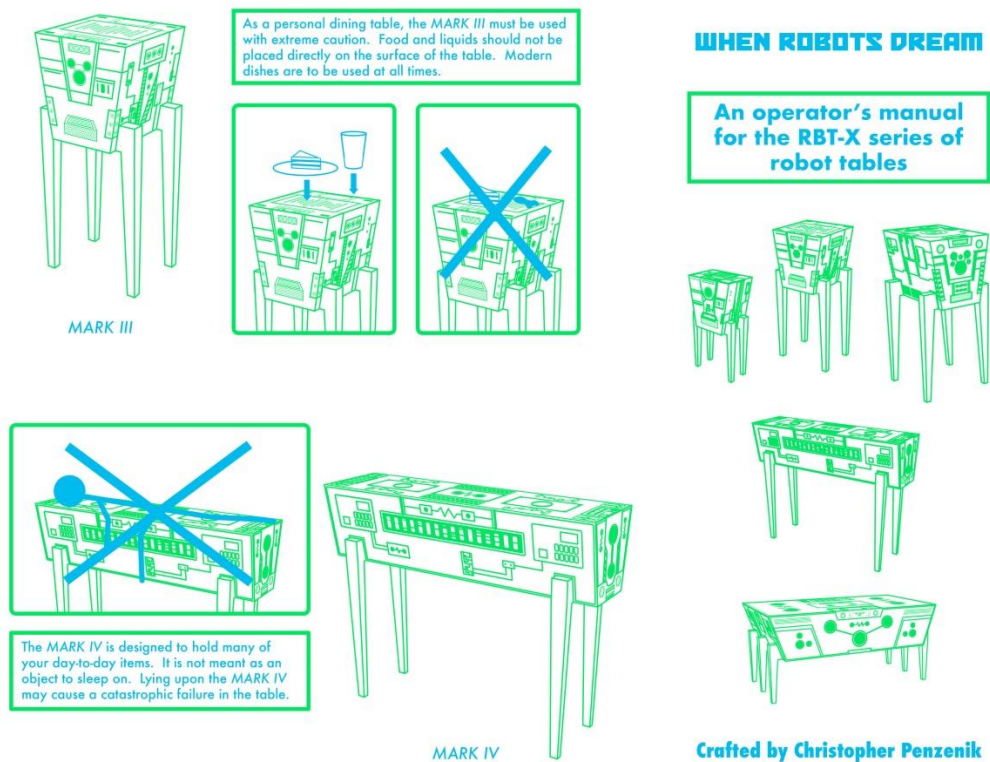


Image 02
When Robots Dream: An Operator's Manual



Image 03
RBT-X: MARK II
Baltic Birch and Cherry
8"x12"x24"



Image 04
RBT-X: MARK III
Baltic Birch and Cherry
12"x12"x30"



Image 05
RBT-X: MARK IV
Baltic Birch and Cherry
38"x10"x30"



Image 06
RBT-X: MARK V
 Baltic Birch and Cherry
 22"x38"x18"



Image 07
RBT-X: MARK X
 Baltic Birch and Cherry
 20"x15"x36"



Image 08
RBT-X: MARK II (Detail)
 Baltic Birch and Cherry



Image 09
RBT-X: MARK III (Detail)
 Baltic Birch and Cherry



Image 10
RBT-X: MARK IV (Detail)
 Baltic Birch and Cherry

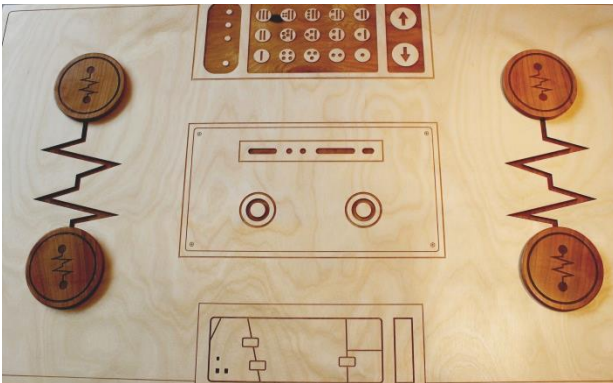


Image 11
RBT-X: MARK V (Detail)
 Baltic Birch and Cherry



Image 12
RBT-X: MARK X (Detail)
 Baltic Birch and Cherry